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Beyond Icons: Developing Horizontally in the Vertical Realm

超越建筑标志性的意义: 垂直领域中的水平向开发

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罗谦信先生于2002年6月被任命为香港置地有限公司的执行董事，负责管理公司在亚太地区投资的项目。罗先生于1988年加入公司，负责了众多主要的高层建筑开发项目，包括香港遮打大厦，新加坡莱佛士码头一号和正在建设的滨海湾金融中心，以及澳门壹号广场豪华综合开发项目。罗先生毕业于美国爱荷华州立大学，拥有建筑学和建筑工程学士学位。

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安东尼•伍德博士，自2006年起担任CTBUH执行理事，负责学会的日常运作。他同时也是芝加哥伊利诺理工大学建筑学院研究副教授和上海同济大学的客座教授，其专业领域是高层建筑设计，尤精于可持续设计。到芝加哥工作前，他曾在香港、曼谷、雅加达、吉隆坡及伦敦等地任建筑师，他的博士论文从多个学科的角度探讨了摩天大楼之间的空中桥廊连接问题。

Abstract

If the horizontal growth of cities is considered unsustainable in terms of land use, infrastructure, energy use and pollution creation, then cities need to grow denser, and in many cases more vertical, to cope with the triple effects of global population growth, urbanization and changing social demographics. Yet all cities rely on the ground plane for circulation, recreation, public facilities, commercial facilities, quality urban habitat and the opportunity for community to develop. In the sustainable city of the future then, it would be beneficial for the ground plane to be notionally introduced at levels in the sky, through linking buildings with skybridges, which connect potentially "public" spaces within the towers. This paper examines the world's most extensive current use of skybridges in Hong Kong, which began with the Hongkong Land network of linked properties in the Central district, and extrapolates to see the benefits of introducing similar at greater height.

Keywords: Skybridges, Pedestrian Walkways, Hong Kong, Hongkong Land, Urban planning, Retail Branding

摘要

如果城市的横向发展在土地利用、基建、能源运用及污染制造上缺乏可持续性，那城市为了应付全球性的人口增长、城市化及蜕变中的人口结构这三重效应，就只能变得更密集，而且在很多情况下变得更纵面。但是，所有城市都需要地平面这空间来提供流通、娱乐、公共设施、商业设施、有质量的城市居住环境，及社区持续发展的机会。在未来可持续发展的城市中，把地平面改为县在空中，以空中桥廊把高层大厦连贯起来，在高层大厦之间形成一个潜在的"公共"空间，是一个很有裨益的概念。本论文审视现行世界上最广泛利用空中桥廊的建筑实践，先从香港置地在香港中区的相互连贯的大厦网络说起，再探讨在更高楼层上引入这个设计的好处。

关键词: 空中桥廊、行人通道、香港、香港置地、城市规划、零售品牌定位

Introduction: Rethinking Cities

As many architects and visionaries have shown over a period spanning more than a century, from the early 20th Century "King's Views of New York" (see Figure 1) to virtually all "urban vision" science-fiction cinematography (Wood, 2003), the re-creation of the urban realm in the sky through connections between buildings at height has a vast potential for the enrichment of our cities. To many it seems nonsensical that, though the twenty-first century has clearly seen a push towards greater height and urban density in our major urban centers, the ground-pavement level remains almost exclusively the sole physical plane of connection.

Additionally, one of the major failings of tall buildings in architectural terms is that most are designed as stand-alone icons superimposed on – rather than integrated into – the urban fabric. Despite the often significant vertical height of these buildings, very few of them connect to the city (or each other) at any level other than the

导论: 对城市的再思考

在过去一个多世纪，由二十世纪初"King眼中的纽约"(见图一)，到几乎所有科幻电影里的城市景象(伍德，2003年)，很多建筑师及具有未来视野的人士都向我们一再显示，以大厦之间的空中连接再创造一个新的城市领域，对提升城市具有巨大潜能。在当今二十一世纪，当各主要城市都明显趋于更高空、更密集的发展时，仍然坚持地面道路才是唯一的物质接口，并不合乎情理。

而且，从建筑学的角度来看，高层大厦其中一个主要缺点，是以一个独立地标的身份加诸城市地貌上，而不是和城市的结构融为一体。这些大厦的垂直度高入云霄，但它们除在地面外就没有其它与城市(或其它大厦)的连接关系。很多时候，这些高空发展项目的目的就是要"脱颖而出"，而不是"交融一片"。

如果说，城市现在是通过高层发展来容纳十倍以至百倍的居民，那，我们就有需要在空中复制那些在地平面提供的种种设

ground plane, and often the very objective of the project brief is to "stand out," rather than to "fit in."

If cities concentrate ten or a hundred times more people at a given location through building tall, there will be a need to replicate the facilities that exist at the ground plane up in the sky, including the parks and the sidewalks, the schools and the shops, and other public/civic functions. The ground plane should be considered as a duplicable layer of the city which needs to be replicated – at least in part – at strategic horizons within and between buildings in the sky; not as a replacement of the ground plane but as an addition to it. Every tall building would then need to be considered as a vital element in an overall, three-dimensional urban framework, rather than as a stand-alone icon superimposed on a two-dimensional urban plan.

Though this idea might seem a far-fetched, fantasy proposition, skybridges are increasingly being realized – albeit in a piecemeal way – in cities around the world. Figure 2 illustrate some of the more significant examples in recent years.

Hong Kong Skybridge Network as Exemplar

Origins and Development of the Hongkong Land Network

Today it is hard to imagine Hong Kong's Central district without its network of above-ground enclosed footbridges. These elevated, mostly air-conditioned, walkways can take pedestrians from one side of Central to the other, come heat, rain or typhoon. Along the way, one is delivered to the office towers and shopping arcades that make up Hongkong Land's Central retail and office portfolio. The skywalks made for a new definition of street life, presenting opportunities to stroll and chat, to watch and meet people over coffees, and to arrive at six meetings a day plus lunch on time – but without the heat, dust, noise and hassle at street level.

Before the 1950s, street life in Hong Kong was still a relic of colonial days, characterized by rickshaws and sedan chairs parked in neat ranks, waiting for business in the shade of banyan trees. By the 1950s Hong Kong was no longer just a major trading port. Its unique blending of cultures and relative political stability had resulted in a burgeoning tourist trade resulting in the development of hotels and buildings with shopping arcades; the latter being the precursor of today's ubiquitous podium shopping malls. As a result, vehicular and pedestrian congestion had become a major issue of concern for those designing and building Hong Kong's commercial center. In the early 1960s, the idea arose within Hongkong Land to connect two of its newest prime properties, Prince's Building and The Mandarin Hotel, by way of an elevated footbridge high above the bustling street (see Figure 3), which was completed and open to the public and hotel guests in 1965. As both buildings were under planning and development at the same time, this facilitated the internal designs of both buildings to incorporate the proposed footbridge as well as the circulation routes to the main office and hotel lift lobbies, retail levels and down to the street level entries. Locating escalators and stairs now became much more important.

It is important to note that HKL had a unique position in Hong Kong, namely that the Company owned several commercial buildings directly adjacent to each other and separated by just 3 roads; Chater Road, Des Voeux Road and Ice House Street. Therefore the ability to connect adjacent buildings by the innovative proposal of footbridges was greatly enhanced since the Company owned the buildings to

Figure 1. King's Views of New York, 1911 (cover illustration "Future New York is pre-eminently the City of Skyscrapers" by Richard W. Rummell)
图一. King 眼中的纽约，1911 年 (封面插图"未来的纽约将主要是个摩天大厦城市"，作者Richard W. Rummell)

施，比如公园、行人道、学校、商店，及其它公共/公民功能设备。地平面应该被视为一个可复制的层带，可在大厦里及大厦之间的战略性水平层予以复制或部分复制，作用不是取代而是增强地平面的效用，这样，每栋高厦都是一个全面、立体城市框架里的一个重要元素，而不再是一个覆盖在平面城市图上的单独地标。

这个概念看起来可能有点牵强，有点幻想的说法，但事实上，空中桥廊在世界各城市却日益成为建筑现实的一部份，虽然其过程略嫌点滴零散。图二提供了近年一些比较显着的建筑例子。

香港的空中桥廊网络的模范作用

香港置地网络的起源及演变经过

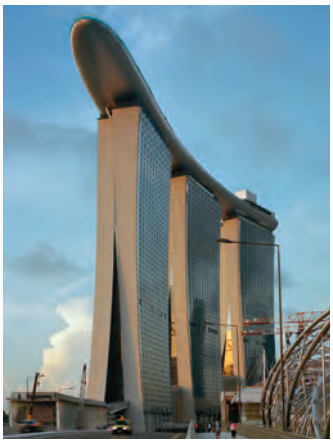
今天，已经很难想象没有离地密封的行人桥廊网络的香港中区是个什么样子了。不管风雨阴晴，这些高架、大部分有空调的步行道把行人从中区的一端引领到另一端，沿路看到办公室大楼和购物商场，鳞次节比，构成香港置地在中环的一个零售商店与办公室的物业组合。空中走廊为城市街道的生活内容赋予了全新定义，行人信步闲逛，边走边聊，咖啡茶聚，或一天之内赶赴六个会议而仍能有一个准时的午餐，无惧街道上的炎热、灰尘、噪音和种种恼人的不便。

在1950年代以前，香港的街道仍充满殖民地时代遗风，人力车和轿子触目可见，在街道上排列成行，在老榕的树荫下守候生意上门。但踏进了五十年代，香港已不仅是一个贸易商埠了，它独特的文化融汇及相对稳定的政治秩序带来了蓬勃的旅游业，酒店及附有购物廊的大厦应运而生，而后者正是今天无处不在的商场的前身。也因此，对设计及发展香港商业中心的人来说，交通及行人拥堵成为一个主要问题。在六十年代初，香港置地内部形成了一个概念，把公司两个最新的优质物业---太子大厦及文华酒店---以高架行人桥连接起来，远离熙攘的地面街道 (见图三)。这概念

Petronas Towers, Kuala Lumpur, 1998

Linked Hybrid, Beijing, 2009

The Pinnacle@Duxton, Singapore, 2009



Marina Bay Sands, Singapore, 2010

Bella Sky Towers, Copenhagen, 2011

Reflections at Keppel Bay, Singapore, 2011

Hangzhou Civic Center, Hangzhou, 2012

The Gate, Abu Dhabi, 2013

Figure 2. Examples of skybridges in recent years
图二. 近年空中桥廊的几个例子

Figure 3. The first indoor footbridge across Charter Road linking Prince's Building and the Mandarin Hotel, constructed in 1965
图三. 跨越遮打道并连接太子大厦与文华酒店的第一道室内行人桥廊，建于1965年。

which the proposed footbridges would connect. Given that the footbridge concept was an untried concept, obtaining the agreement of other owners to connect to their buildings would no doubt have been a long and possibly fruitless endeavour at that time.

The early success of that very first footbridge meant that the concept was to feature strongly in Hongkong Land's 1970s master plan to reshape the heart of the Central Business District through its programme of demolishing and redeveloping its existing portfolio of buildings. The first phase, involving the redevelopment of the existing 20-story Alexandra House into its larger 36-story successor, was followed by the demolition of five old Hongkong Land buildings to make way for the mammoth Landmark complex. Between 1978 and 1983, the Company joined the new Alexandra House, which by virtue of its central position within the portfolio became the "hub" of Central's skywalks, with four footbridge connections radiating out to Prince's Building, Swire House (which was redeveloped as Chater House in 2002) and The Landmark complex. Further connections were added upon the completion of Exchange Square Towers One and Two, in 1985.

At this point, the concept launched by Hongkong Land was compelling enough that owners of neighboring buildings saw value in linking their properties to the company's footbridge network. Between 1985 and 1990, extensions followed to the adjoining Central Building, and across Queen's Road to Central Tower, and then across Wyndham Street into the Entertainment Building. By 1990, a Hongkong Land footbridge from Prince's Building was built into the new Standard Chartered Bank Building, and further extended into the Hong Kong Bank headquarters and to Battery Path. The main "ring" in Central was finally complete when Hongkong Land constructed a footbridge across Ice House Street to link their newly completed 9 Queen's Road to The Landmark.

Various owners of commercial premises in Central followed suit in the 1990s, and, by way of negotiating amongst each other, and facilitated by favorable government policies, constructed footbridges and linkages to expand the system. AIG Tower (now AIA Center) built in 2005 provided a new footbridge from Chater Garden, bringing public from the business core of Central to the future regeneration of the City Hall complex across Connaught Road (Leung 2013).

At the turn of the new Century, the potential commercial and urbanistic benefits of skybridges became widely recognized, and

began to be reflected in partnerships between government and private developers. The 2003 redevelopment of the Alexandra House retail podium enabled the existing first-floor external podium walkways to be removed. As a result of planning agreements with the Hong Kong government, Hongkong Land was able to create dedicated internal passageways through the building, linking to the existing external footbridges and allowing 24-hour access to the public. In exchange, Hongkong Land was granted an additional 5200 m^2 of developable area by the Buildings Department. This translated into an additional floor of retail as part of the major renovations.

This same holistic view of redevelopment was carried through into The Landmark refurbishment scheme from 2003-2007, again incorporating internal 24-hour dedicated public passageways and a new vehicular drop-off on Queens Road Central, linked by numerous escalators to the footbridge levels as well as to the existing basement level MTRC connections.

The major re-configuration of the retail podiums of Alexandra House and the Landmark enabled the re-examination of the potential of these two premises, in terms of both development and architectural design. In both cases, the opportunity to re-configure the internal circulation patterns was explored, to the extent that major structural alterations were carried out to create new voids, re-adjust floor levels, re-arrange escalators, and extensively reshuffle tenant spaces (Leung 2013).

Local and Global Significance of the Hong Kong Skybridge Network

Hongkong Land's bridge network is now almost 50 years old, since the date when the first bridge connection was made between The Mandarin Hotel and Prince's Building. For the first half of the network's existence, footbridges were mainly regarded as functional; that is to say to permit pedestrians to walk from one building to another in comparative convenience and safety. From the late 1990s, coinciding with the globalization of retail branding and commercial office tenants' demands for more sophisticated working environments, the footbridge network has been developed far beyond their original remit. They now act as seamless extensions to the traditional office lobby and retail mall, to the point that the distinction between building and footbridge are blurred. They are recognized for more than their convenience value, as they possess an actual commercial value, and are now planned as retail spaces with opportunities for branding and exhibitions. Their planning and interior design are treated no differently to the office lobbies or retail malls to which they connect. Legislatively, the Hong Kong Government also recognize that skybridges are a permanent

Figure 4: Pedestrians utilize the skybridge connecting Alexandra House to The Landmark
图四 行人利用历山大厦与置地广场之间的空中桥廊

在1965年成为现实，高架行人天桥在那年开放予酒店房客及公众人士。 当时，两栋建筑物亦同时进行发展计划，内部设计正可兼容建议中的行人天桥，及通往主要办公室、酒店升降机大堂、零售商铺楼层和街道出口的各通道。电梯和楼梯的位置选择从此变得更加重要了。

在此，必须要明白一个事实，香港置地在香港占有一个很独特的地位，那就是，公司拥有几个邻近的商业大厦，之间相隔只有三个街道: 遮打道、德辅道及雪厂街，因为这几栋大厦都是公司的物业， 这大大提高了以行人桥廊把相邻大厦连接起来的创见及实现能力。但是，行人桥廊始终是一个未经尝试的概念，要取得其它业主同意把其建筑物连接，无疑是一个漫长过程，而最后可能徒劳无功。

但是，第一个行人桥廊启用后非常成功，这个概念也进而成为香港置地1970年代总规划中一个有力元素，而七十年代的这个总规划是通过拆卸及重建公司当时的物业组合来重塑整个中区的商业核心地带。 第一个阶段是将当时二十层高的历山大厦重建成三十六层的新厦，之后把五栋香港置地旗下的旧物业拆卸，让路予最新的巨型项目置地广场。 在1978年和1983年之间，公司因应新历山大厦在整个置地物业群的中心位置，以它为中环空中走廊网络的中心点，以四道行人桥廊散射向太子大厦、太古大厦 (重建后于2002年改名为遮打大厦) 及置地广场。1985年，交易广场第一、第二座相继落成，空中走廊网络亦相应扩张到该处。

在这阶段，香港置地的空中走廊概念显示了它的优胜点，邻近大厦的业主目睹其价值，相继把他们的物业与香港置地的空中走廊网络连接起来。在1985和1990年间，网络扩展至邻近的中建大厦，横跨皇后大道，接上中汇大厦，再越过云咸街，连接上娱乐行。到了1990年，香港置地太子大厦的行人桥廊伸展至渣打银行新大楼，其后再伸延到汇丰银行总行，连接到炮台里。到香港置地再兴建一道行人桥廊横跨雪厂街，把新落成的皇后大道九号与置地广场接连起来后，中环就完成一个完整的"主环"了。

在1990年代，中环好几个商厦的业主亦跟随香港置地的做法，他们通过协商，在得到政府相应的政策配合后，兴建了行人天桥及连接通道，进一步扩充了这个系统。在2005年落成的美国国际集团大厦 (今名友邦金融中心) 再由遮打花园增添一条行人天桥，把行人从中区的核心商业区引带领到干诺道对开的大会堂综合区，未来重新发展的所在地点。 (Leung 2013年)

到本世纪初，空中走廊的潜在商业价值及城市规划利益已广为人知，亦逐渐在公私合营发展项目中得到体现。 历山大厦零售楼层在2003年的重建，拆除了第一层外部平台的通道，在和香港政府取得发展规划协的基础上，香港置地另外在大厦内开辟专用通道，穿越大厦本身，连接起外部已有的行人天桥，为公众提供了二十四小时开放的通道。作为代价，政府屋宇署授予香港置地额外五千二百平方米的发展面积，经重大翻新后成为额外的零售面积。

以上的整体重建概念亦落实到置地广场2003至2007年的翻新计划中，这个计划亦包含了二十四小时开放的专用公众通道，及一个新的在皇后大道的汽车落客点，落客地点提供了多道扶手电梯，接驳到各行人天桥楼层及现时的地下地铁站。

fixture of 21st century urban design; footbridges are now subject to requirements in respect of disabled access, fire suppression (sprinkler) systems and the spread of fire from one building to the next.

Today, Central's elevated skybridge network and other areas of Hong Kong, is a significant urban gain for pedestrians (see Figure 4). The urban benefits of such a raised public route cannot be overstated;

- Diminished pedestrian congestion at ground level
- Increased pedestrian mobility
- Improved pedestrian environment
- Improved pedestrian safety / security
- The potential for overlap/connection of functions between buildings
- Easier routing of utilities and services – power, telecommunications, water, waste etc
- Use of the network as an alternative for services to give redundancy in the event of emergencies etc.
- Opportunities for access to gardens and the greening of the roofs.

Today the portfolio of skybridge-linked Hongkong Land buildings in the Central district draws together twelve separate major building complexes, over 440,500 square meters in gross floor office / retail area and a working population of over 40,000 people. In terms of the linked shopping areas – the original motivation for connecting the complexes

历山大厦及置地广场零售楼层的重大改建让公司重新思考这两个楼宇的发展潜力及建筑设计。在这两个个案上，公司都对建筑物的内部流通模式进行了探索，实施了重大的结构改动，创造出新的空间带，调整楼层，重新布置扶手电梯，及大规模重组租铺空间 (Leung 2013年)。

香港空中桥廊网络的本地与国际意义

从第一道桥廊把文华酒店与太子大厦贯通那天算起，到今天，香港置地的桥廊网络已经接近半个世纪。在这个五十年的前半部，对行人桥廊的着眼点主要是功能性的，就是说，把行人从一个大厦带到另一个大厦，所提供的是便捷及安全性。从1990年代末期开始，配合零售品牌的全球化趋势及商厦租客要求更精致的工作环境，行人桥廊网络的发展逐渐超越它原本的职能。现在，它们已经成为办公室大堂及零售商场无缝伸延的一部份，哪一点是大厦本身部份，哪一点是桥廊的起点，已经无从分辨。现在，它们已不仅仅提供方便，它们已经拥有具体商业价值，在规划上被视为零售面积的一部份，为品牌定位及品牌展示创造了条件，它们的规划及内部设计与传统办公室大堂及零售商场无异。香港政府也认识到，空中桥廊是二十一世纪城市设计的永久特征，在立法上，也订立了桥廊符合残障人士无障碍设施、消防 (洒水) 系统，及防止火灾在建筑物之间蔓延的有关规定。

今天，中环及香港其它地区的空中桥廊网络为行人提供显着的城市增益 (见图四)。这种离地公共路径，提供了莫大的市政利益。它们:

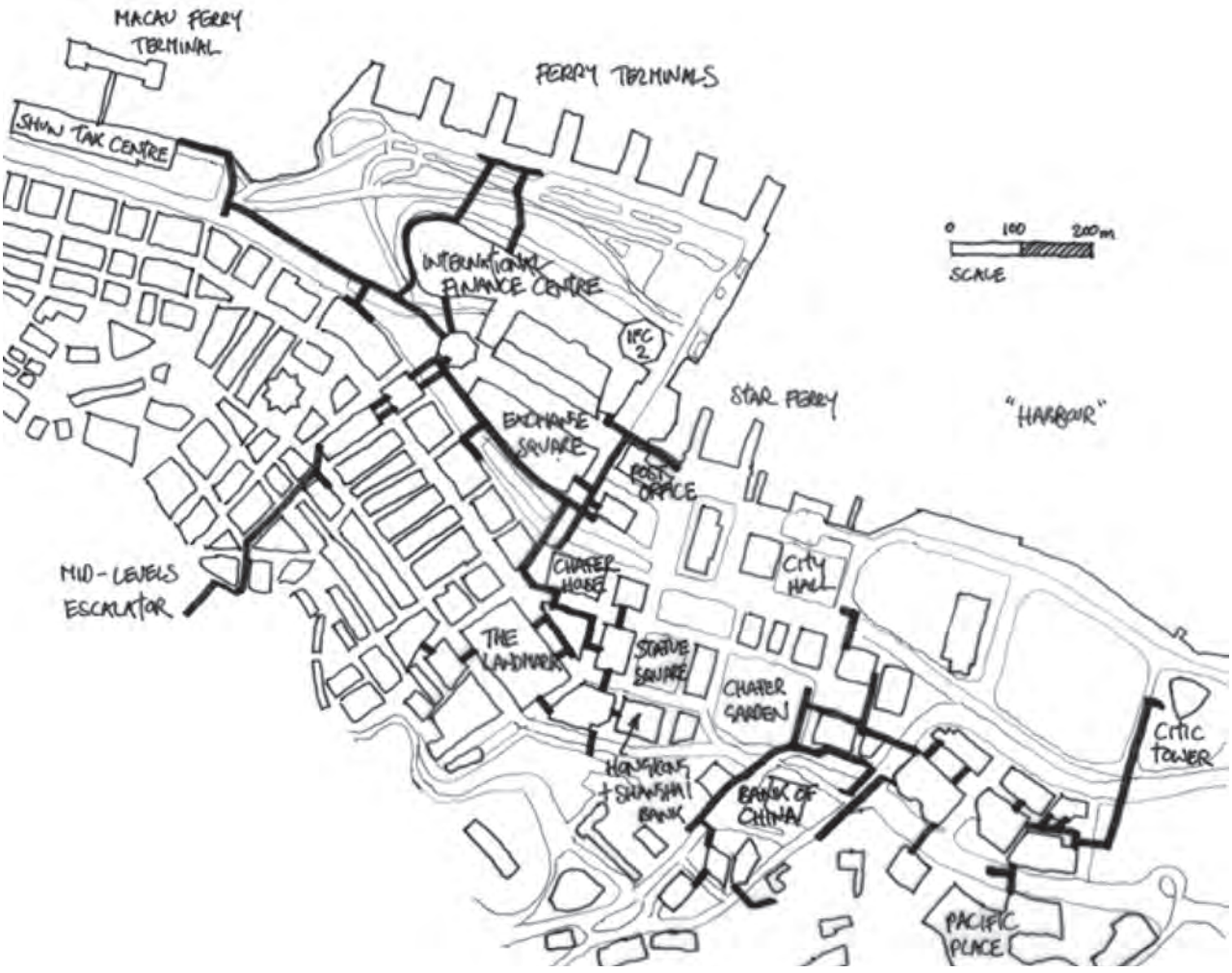


Figure 5. Extent of skybridge network in the central district of Hong Kong © Antony Wood (drawn 2006)
图五 香港中区今天的空中桥廊网络范围 © 安东尼·伍德绘于2006年

with skybridges – approximately 58,000 square meters of gross retail floor area is now linked over five (5) separate sites – Prince's, Alexandra, The Landmark, Chater and Exchange Square. This gives the collective retail offer a "critical mass," which would be significantly diminished if it were housed in isolated buildings.

Without these footbridges, which the company maintains and regularly renovates, Hongkong Land would perhaps not have been able to sustain the value, critical mass and competitiveness of its entire core Central portfolio of buildings. The impact is fundamental to the daily life of those working or shopping in Central and, likewise, the value of Hongkong Land's properties. In turn, the bridges have been extended by others to provide an aerial world of shops and communication across much of metropolitan Hong Kong and Kowloon.

The impact has extended far beyond Hong Kong, of course. Other world cities, such as Minneapolis, Chicago, Montreal, and Toronto have their own versions of skyways and below ground pedestrian walkways/tunnels that provide a quasi-public right of way between numerous conditioned buildings. However, no city has as extensive a skybridge network as Hong Kong.

Adoption of Skybridges as Urban Policy in Hong Kong

The Hong Kong skybridge network in Central now extends 7 kilometers across 40 buildings (see Figure 5). The government has recognized the network's value as an urban asset, connecting the network to public parks and pedestrianized zones, allowing car-free pedestrian movement from Admiralty to Sheung Wan, and also to the Central-mid-level Escalator System. In addition, the same strategies have been employed in other areas on the island, Kowloon and even in parts of the New Territiories. The success of the system in Hong Kong demonstrates the importance of cooperation between developers and the government (Leung 2013).

Horizontal Marketing and Branding of the Skybridge Network

The private-ownership control element has a significant impact on the success of the skybridge network, since the form of the skybridge and space it encloses is seen as an extension of the tower lobby and/or retail mall. Each owner-operator thus puts in significant resources (probably much greater than the financial contribution which could be afforded by typically resource-stretched local governments) to ensure high levels of cleanliness, maintenance and security of the skybridges, both internally and externally. This, in turn, has a significant effect on maintaining a high-quality environment for the pedestrian.

In the 1990s and early 2000s, as Hongkong Land extensively upgraded and revitalized its Central portfolio, its 12 pedestrian footbridges came under the microscope. Bridge interiors were redesigned to reflect a modern, luxurious aesthetic that incorporated a branding program and improved signage and wayfinding. The company had achieved its primary objectives of providing seamless and comfortable transitional spaces between its dozen Central buildings for its tenants and the public. While the renovations gave the footbridges their own subtle Hongkong Land family-identity, they also complemented the designs of each of Hongkong Land's unique buildings to which they connected.

The re-alignment of escalators, arcades and entrances in Alexandra House, so that pedestrians, while strolling along footbridges, could get a glimpse of the daylight across the other side of the building, strengthened the sense of direction, and enhanced the attraction of walking across the space. The demolition of the old Landmark East Tower opened up the Landmark Atrium onto Queens Road Central. The re-configuration of horizontal routes and vertical circulation in

- 减少地面行人拥堵
- 增加行人流动性
- 改善行人步行环境
- 加强了行人的安全性
- 具有重复支持/连接大厦之间功能的潜力
- 更便捷的电力、电讯、供水、废弃处理等设施与服务的路径
- 在紧急情况下，廊桥网络为各服务提供多一个选择方案及后备支持。
- 提供通往花园的出入设施及为屋顶绿化创造条件

今天，香港置地在中环的物业组合都包含在空中桥廊网络之中，这网络连贯了十二个独立主要商厦，逾44,500平方米办公室/零售建筑面积，服务超逾四万名上班族。它所连贯的商场面积----这也是当初以空中桥廊连接商厦的目的---约达58,000平方米零售建筑面积，贯串了五个独立地点: 太子大厦、历山大厦、置地广场、遮打大厦及交易广场。这网络构成一个集体零售面积，形成一个"关键性的群众聚合力"，它所提供的价值，远大于独立商场，亦远非独立商场所能比拟。

对这些行人桥廊，香港置地都进行保养及定时翻新，假如没有了它们，香港置地在中环的物业组合，就可能无法维持其价值、关键的群众聚合力及竞争力。它们对中环上班族及购物人士的影响是深远的，对香港置地维持物业的价值，当然，也是根本性的。另一方面，其它人士也在香港及九龙其它地区扩建空中桥廊，提供了一个架空商场及流通空间。

这个影响亦已经超越香港范围，其它世界级城市如明尼亚波里斯、芝加哥、蒙特利亚及多伦多也有他们自己版本的空中走廊及地下行人通道/隧道，在众多的空调建筑物之间提供半公共性的通道权，但没有一个城市拥有如香港一样的那么广泛的空中走廊网络。

香港的空中桥廊城市策略

如今，香港中区的空中桥廊网络伸展达七公里，涵盖四十栋大厦(见图五)。香港政府亦认识到这网络的市政价值，把网络与公园及行人地带衔接起来，行人可在无车环境下从金钟步行到上环，及中环的半山区电梯系统。此外，政府也在港岛、九龙其它地区以至新界部份地区引入相同政策。香港的成功经验彰显了发展商与政府合作的重要性 (Leung 2013年)。

空中桥廊网络的横向市场推广与品牌定位

空中桥廊的私人控制权对整个网络的成功有重大影响，因为，人们把桥廊的形态及其涵盖的空间视为商厦大堂及/或零售商场的有机伸延部份。每一个业主管理者都会投放大量资源(可能比一般财源紧绌的地区政府所能负担的要大得多)，确保空中桥廊内部外部都清洁无瑕、保养充足及安全可靠，这在维持一个高质量的步行环境上影响重大。

在1990年代及2000年代初期，香港置地进行大规模重建，以提升它的中区物业组合。在这过程中，它建造及/或管理的十道行人桥廊成为研究焦点。公司重新设计桥廊内部，在现代豪华的美学观下凸显品牌定位，对标识系统及方向指引进行改良，达到为租户及公众人士提供无缝舒适的过渡空间这个主要目标。翻新工程巧妙地为行人桥廊注入香港置地的企业身份标志，同时亦把桥廊与它们连接的独特商厦进行风格上的配合、融合。

Princes Building achieved better visual connections between the three major footbridges to Alexandra House, Standard Chartered Bank and The Mandarin Oriental Hotel. In all cases, such innovative re-planning achieved even more efficient retail areas, despite the widening of public passages (Leung 2013). Currently the potential of the skybridge network is being pushed even further by Hongkong Land, with the "horizontal branding" of the entire retail network as one horizontal "mall", the "Landmark" retail branding campaign, linking their four key retail podiums.

Alternative MEP Routing via Skybridges

A further benefit of Hong Kong's skybridge links between buildings is the alternative routing – and paths of redundancy – offered in terms of utilities and MEP services etc. For example, when Hongkong Land decided to extend its highly energy efficient seawater cooled air conditioning system to the new Landmark complex in the late 1970s, rather than dig trenches in the streets for the large supply and return seawater pipes, they decided to install the pipes within its covered walkways, connecting services from building to building at a much lower construction cost, with easier access for future repair and maintenance.

The Future is Above Us

There is great potential for cities to implement more skybridges such as those in Hong Kong and at greater height, with manifest benefits for real-estate value, the urban realm, and safety.

One potential aspect for Hong Kong, and many other vertical cities, is created by the combination of dense clusters of towers in very close proximity, combined with the requirement for "refuge floors" as part of existing high-rise evacuation code (see Figure 6). One can imagine these common-level, refuge floors being connected with skybridges (or perhaps "skyplatforms"), spanning the relatively short distances between the towers resulting in multiple benefits to the occupants.

And finally, skybridges are becoming accepted as habitable spaces rather than just connection or transitionary spaces. Retail shops are now allowed on footbridges, and one now sees examples of large, double level footbridges. The development potential of skybridges has no upper limit, save for usage legislation.

Conclusion

In conclusion, the following list is offered as a summary of how high-level skybridge connections could contribute to the re-thinking of both our tall buildings and our cities:

1. Alternative circulation routes for pedestrians which are more efficient (and energy efficient).
2. Provide pedestrians protection from extreme climatic elements (hot, cold, humidity, rain, wind, etc.)
3. With their good illumination and security control, provide pedestrians with a much safer route at night.
4. Allow more efficient (and energy efficient) circulation of occupants between neighboring towers.
5. Allow easier access to functions shared between towers, thus increasing the viability of those functions.
6. Allow the connection and expansion of commercial or retail space into a neighboring buildings.

历山大厦重新布置了扶手电梯、走廊及入口，行人在桥廊上可看到廊外日光及对面大厦，不仅增强了方向感，也提高了穿越桥廊的体验。置地广场拆卸旧东翼，置地广场中庭因此能面向皇后大道中。太子大厦改变了它整个横向路线及纵向流通系统，与连接历山大厦、渣打银行及文华东方酒店的三道行人桥廊形成共同视线空间。以上的例子，都显示创新性的重新规划不仅扩阔了公众通道，亦释放出更多的零售面积 (Leung 2013年)。目前，香港置地正探讨进一步发挥空中桥廊的潜力，把整个零售网络作统一的品牌定位，形成一个横向性流动的"商场"; 公司也已重整"置地广场"的零售品牌部份，把四个主要零售平台连接起来。

空中桥廊为机电提供一个后备路径

香港大厦之间的空中连接还有另一个好处: 为公用事业及机电设施提供一个后备铺管路径。举个例子，在1970年代末，当香港置地要在新的置地广场应用它的高效能海水冷却系统时，不需要挖掘路面来安装海水供应及回收管，而是直接将管道安装在有盖行人桥道内，把有关服务输送到各个商厦，这不仅减低了建造成本，也方便了后来的维修保养。

未来在我们的上空

未来各城市实施如香港一般的空中桥廊，或在更高空兴建空中桥廊，其潜在发展潜价值将会是巨大的，而其对地产物业价值、城市空间及安全方面的利益尤为明显。

对香港及很多其它垂直发展的城市来说，一个大有发展空间的潜在领域，是城市里密集而近距离的大厦群，和现行高楼避难法规

Figure 6. Hong Kong: the presence of common-level "refuge floors" in many of the separate towers allow easy incorporation of short skybridge linkages © Antony Wood
图六. 香港: 很多独立高厦的庇护隔火层都在同一楼层，以短距离的空中桥廊把它们连接起来，是一件轻而易举的事 © 安东尼伍德

Figure 7. Skybridges can offer a new opportunity for commercial floor space and building revenue
图七. 空中桥廊能创造新的商业楼层面积及大厦营收

7. Offer access to a better environment at height in increasingly dense cities (improved light, air, and views)
8. Provide the opportunity for a greater sense of "community" to develop in neighboring tall buildings (skybridges as "streets in the air") creating social-interaction spaces.
9. Create gardens at height (skybridge as "skygarden"), as well as large areas of green roofs.
10. Improved evacuation efficiency (and multiple routing options) in tall buildings.
11. Improved emergency responder access to tall buildings (firefighters given access to an at risk tower at a high level through elevators in adjoining "safe" tower)
12. Redundancy and alternative routings for services provisions.
13. Gain in commercial floor space / building revenue, through minimization of fire stairs and refuge floors requirements (See Figure 7)
14. Offer the opportunity for an improved urban fabric which relates to both the culture and environment of the city, by requiring each building to be an essential part of an urban whole, rather than a stand-alone icon.

所规定的避难隔火楼层 (见图六) 。我们不妨想象一下这情景: 各大厦的共同避难隔火楼层以空中桥廊 (或空中平台) 短距离凌空连接，为大厦居民带来林林总总的设施和便利。

最后，空中桥廊也逐渐被视为栖息空间，而不仅是过渡性的空间连接。现在，行人桥廊上已经有零售店，大型双层的行人桥廊亦时有所见。事实是，除了法规上的使用规定以外，空中桥廊的发展潜能没有上限。

结论

作为总结，下面综合一下高层空中桥廊连接对高层大厦及城市的贡献:

1. 提供另类行人流通路线，更高效能 (更具能源效益)
2. 保护行人免受极端天气影响 (炎热、寒冷、潮湿、降雨、翻风等)
3. 良好的照明及保安控制为行人提供一个更安全的晚间步行路线
4. 提供大厦之间更高效能 (及更有能源效益) 的居民流通
5. 大厦更易获得功能分享，从而增强这些功能的可行性
6. 把商业或零售空间连贯及扩展到邻近大厦
7. 在日益稠密的城市环境中提供一个更好的架空环境 (更明亮、更好的空气及景观)
8. 为邻近高厦提供机会凝聚更强的"社区"归属感 (空中桥廊变身为空中街道)，创造社会互动空间。
9. 创建架空花园(空中桥廊化为空中花园)及大面积的绿色屋顶
10. 提高高层大厦的避难效率 (提供多个路径选择)
11. 为紧急应变人员提供更便捷的大厦通道 (消防员可利用邻接"安全"的大厦电梯上升到某一个高楼层，由那里进入发生风险事件的大厦)
12. 为各服务设施提供后备路径选择。
13. 把消防梯道及庇护隔火层的规定空间降到最低，释放出商业楼面面积/提高大厦营收 (见图七) 。
14. 要求每个大厦都把自己视为整体城市的一部分，而不是自成一国的独立地标，以此为机契机去创造一个更好的、与当地文化及环境息息相关的城市格局。

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